

U.S. Serial No. 09/747,774

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In the Claims:

The below listing of claims will replace all prior versions, and listings, of claims in the application:

1. **(Previously Presented)** A mixture of recombinant yeast cells, each cell of which comprises:
 - (i) a recombinant gene encoding a heterologous orphan G protein-coupled receptor wherein said receptor is expressed on the cell membrane of said cell such that signal transduction activity is modulated by interaction with an extracellular signal; and
 - (ii) a recombinant gene encoding a heterologous test polypeptide, wherein the test polypeptide is transported to a location allowing interaction with the receptor expressed on the cell membrane,wherein collectively the mixture of cells expresses a library of said test polypeptides, and modulation of the signal transduction activity of the receptor by a heterologous test polypeptides within the library provides a detectable signal.
2. **(Previously Presented)** A mixture of recombinant yeast cells, each cell of which comprises:
 - (i) a heterologous orphan G protein-coupled receptor wherein said receptor is expressed on the cell membrane of said cell such that signal transduction activity is modulated by interaction with an extracellular signal;
 - (ii) a recombinant gene encoding a heterologous test polypeptide, receptor, wherein the test polypeptide is transported to a location allowing interaction with the receptor expressed on the cell membrane; and
 - (iii) a reporter gene construct containing a reporter gene in operative linkage with one or more transcriptional regulatory elements responsive to the signal transduction activity of the receptor,wherein collectively the mixture of cells expresses a library of test polypeptides.
- 3-4. **(Cancelled)**
5. **(Previously Presented)** A mixture of recombinant yeast cells, each cell of which comprises:

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- (i) an orphan G protein-coupled receptor wherein said receptor is expressed on the cell membrane of said cell such that signal transduction activity is modulated by interaction with an extracellular signal;
 - (ii) a recombinant gene encoding a heterologous test polypeptide and including a signal sequence for secretion, wherein the test polypeptide is transported to a location allowing interaction with the receptor expressed on the cell membrane; and
 - (iii) a reporter gene construct containing a reporter gene in operative linkage with one or more transcriptional regulatory elements responsive to the signal transduction activity of the receptor,
- wherein collectively the mixture of cells expresses a library of test polypeptides.

6-7. (Cancelled)

8. (Previously Presented) A mixture of recombinant yeast cells, each cell of which comprises:

- (i) an orphan G protein-coupled receptor wherein said receptor is expressed on the cell membrane of said cell such that signal transduction activity is modulated by interaction with an extracellular signal; and
- (ii) a recombinant gene encoding a heterologous test polypeptide and including a signal sequence for secretion, wherein the test polypeptide is transported to a location allowing interaction with the receptor expressed on the cell membrane,

wherein collectively the mixture of cells expresses a library of test polypeptides, and modulation of the signal transduction activity of the receptor by a test polypeptide within the library provides a detectable signal.

9. (Previously Presented) The mixture of claim 8, wherein each cell further comprises a reporter gene construct containing a reporter gene in operative linkage with one or more transcriptional regulatory elements responsive to the signal transduction activity of the receptor, expression of the reporter gene providing the detectable signal.

10. (Previously Presented) The mixture of claim 8, wherein the reporter gene encodes a gene product that gives rise to a fluorescence detectable signal.

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11. **(Previously Presented)** The mixture of claim 9, wherein the reporter gene encodes a beta-galactosidase gene product.

12-16. **(Cancelled)**

17. **(Previously Presented)** The mixture of claim 8, wherein each cell further comprises a heterologous gene construct encoding the receptor.

18-24. **(Cancelled)**

25. **(Previously Presented)** The mixture of claim 8, wherein the variegated population of test polypeptides includes at least 10^3 different test polypeptides.

26. **(Previously Presented)** A recombinant yeast cell, comprising:

- (i) a recombinant gene encoding a heterologous G protein-coupled receptor protein wherein said receptor is expressed on the cell membrane of said cell such that signal transduction activity is modulated by an extracellular signal;
- (ii) a recombinant gene encoding a heterologous test polypeptide, wherein the test polypeptide is transported to a location allowing interaction with the receptor expressed on the cell membrane; and
- (iii) a reporter gene construct containing a reporter gene in operative linkage with one or more transcriptional regulatory elements responsive to the signal transduction activity of the receptor.

27. **(Previously Presented)** The recombinant cell of claim 26, wherein the reporter gene encodes a fluorescence gene product that gives rise to a fluorescence detectable signal.

28-35. **(Cancelled)**

36. **(Previously Presented)** The recombinant cell of claim 26, which yeast cell is a *Saccharomyces* cell.

37. **(Previously Presented)** The recombinant cell of claim 26, which yeast cell is a *Schizosaccharomyces* cell.

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38. (Cancelled)

39. (Previously Presented) A mixture of recombinant yeast cells, each cell of which comprises:

- (i) a recombinant gene encoding a heterologous orphan G protein-coupled receptor wherein said receptor is expressed on the cell membrane of said cell such that signal transduction activity is modulated by interaction with an extracellular signal;
- (ii) a recombinant gene encoding a heterologous test polypeptide and including a signal sequence for secretion, wherein the test polypeptide is transported to a location allowing interaction with the receptor expressed on the cell membrane; and
- (iii) a reporter gene construct containing a reporter gene in operative linkage with one or more transcriptional regulatory elements responsive to the signal transduction activity of the receptor,

wherein collectively the mixture of cells expresses a library of test polypeptides.

40-49. (Cancelled)

50. (Previously Presented) The mixture of claim 39, which yeast cell is a *Saccharomyces* cell.

51. (Previously Presented) The mixture of claim 39, which yeast cell is a *Schizosaccharomyces* cell.

52. (Cancelled)

53. (Previously Presented) The mixture of claim 39, wherein the variegated population of test polypeptides includes at least 10^3 different test polypeptides.

53-76. (Cancelled)

77. (Previously Presented) The mixture of any of claims 1, 2, 5, 8 or 39, wherein the G protein-coupled receptor is selected from the group consisting of a

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chemoattractant peptide receptor, a neuropeptide receptor, a light receptor, a neurotransmitter receptor, a cyclic AMP receptor, and a polypeptide hormone receptor.

78. **(Previously Presented)** The recombinant yeast cell of claim 26, wherein the G protein-coupled receptor is selected from the group consisting of a chemoattractant peptide receptor, a neuropeptide receptor, a light receptor, a neurotransmitter receptor, a cyclic AMP receptor, and a polypeptide hormone receptor.